Bulletin 008 Rev. A

Model AG168 Standard Response Upright Sprinkler (SIN AG1124)

Note: This sprinkler is a Control Mode sprinkler.

Sprinkler Identification Number AG1124

Features:

1. Utilizes Standard Response center strut solder sensor.
2. 165 °F (74 °C), 212 °F (100 °C) and 286 °F (141 °C) temperature ratings.
3. Available in brass, lead coated, wax coated and wax over lead coated finishes.
4. Provides higher flows at much lower pressures for all occupancies, especially in high density applications, such as the protection of high-piled storage.
5. Limits density increases for plastic pallet applications per NFPA 13.

Listings & Approvals

1. Listed by Underwriters Laboratories Inc. and UL certified for Canada (cULus) to include storage applications.
2. FM Approved

Technical Data

Applications

Wet, Dry and Pre-Action Sprinkler Systems

Hazards

Ordinary, Extra Hazard and Storage Occupancies per NFPA 13

For Sprinkler Spacing, Positioning, and Density/Area Flow Calculations: refer to NFPA 13

Minimum Working Pressure

7 psi (0,5 bar) residual (flowing)

Maximum Working Pressure

Rated 175 psi (12,1 bar)
Factory tested to 500 psi (34, 5 bar)

Discharge Coefficients (K Factor)

K=16.8 GPM/psi $^{1/2}$ (241,9 LPm/bar) $^{1/2}$

Pipe Thread Connection

¾ NPT (R3/4)

Overall Length

2 $^{7}/_{8}$ inch (73 mm)

Product Description

The Model AG168 Automatic sprinkler utilizes the center strut solder in compression principle of construction. The fusible alloy is captured in the cylinder of the solder capsule by a stainless steel ball. When the fusible alloy melts, the ball moves into the cylinder allowing the cylinder to separate from the center strut. When this happens, the lever is released to spring free from the sprinkler so that all operating parts clear the waterway allowing the deflector to distribute the discharging water in a hemispherical pattern.

The Model AG168, 16.8 K-factor sprinklers were tested in full scale fire tests to qualify them for the protection of rack and high piled storage.

Ordering Information

Specify:

1. Model AG168 Upright
2. Temperature rating (see page 2)
3. Finish (see page 2)
4. Model AG4 Installation Wrench

Model AG4 Wrench

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Design Criteria

cULus Listing Requirements

The AG Standard Response AG168 Upright Sprinkler is cULus Listed for use in occupancy classifications up to and including Extra-Hazard, for hydraulically calculated wet or dry systems per NFPA 13, with a minimum operating pressure of 7 psi (48,3 kPa) in wet or dry systems. Use the standard sprinkler positioning requirem ents and density/area sprinkler protection criteria provided in NFPA 13.

Also:

The AG168 Sprinkler is cULus Listed for use in High-Piled storage Occupancies as defined in NFPA 13. This sprinkler may be used for the protection of solid piled, palletized, rack storage (single, double, multiple-row and portable), bin box, and shelf storage including, but not limited to: encapsuled or unencapsulated Class I-IV and Group A or B plastics, cartoned, expanded or unexpanded, as well as exposed unexpanded. For hydraulically calculated wet or dry systems per NFPA 13 with a minimum operating pressure of 7 psi (0,5 bar). Use the standard sprinkler positioning requirements and density/area sprinkler protection criteria provided in NFPA 13 for High-Piled Storage Occupancies.

FM Approval Requirements

The AG Standard Response AG168, K-16.8 Upright Sprinkler is approved to be installed as an area/density in accordance with FM guidelines. (FM guidelines may be different from UL and C-UL Listing criteria).

Examples of High-Piled Storage without in rack sprinklers:

1. NFPA 13 provides ceiling-only protection (no in-rack sprinklers) criteria using open frame (no solid shelves) single, double, multiple-row, or portable rack storage (without the need for in-rack sprinkler protection) of cartoned or uncartoned unexpanded Group A or B plastics, or, cartoned exp anded Group A or B plastics, with:
   - A storage height of up to 20 ft (6,1 m)
   - A maximum ceiling height of 27 ft (8,2 m)
   - A minimum deflector to top of storage clearance of 18" (457 mm)
   - A minimum design density of .60 gpm/ft ^{2} (24,4 mm/min)
   - A minimum operating pressure of 7 psi (0,5 bar)
   - A minimum design area of 2,000 ft ^{2} (186 m ^{2}) for wet systems or 2,600 ft ^{2} (242 m ^{2}) for dry systems

Note: The AG168 Sprinkler can be used in any application or building height as allowed by NFPA13 or FM guidelines. The AG168 is a standard response standard spray sprinkler with a larger K factor to provide greater water flows at lower pressures.

2. NFPA 13 provides ceiling-only protection (no in-rack sprinklers) criteria using open frame (no solid shelves) single, double, multiple-row, or portable rack storage (without the need for in-rack sprinkler protection) of cartoned or uncartoned unexpanded Group A or B plastics, with:
   - A storage height of up to 25 ft (7,6 m)
   - A maximum ceiling height of 30 ft (9,1 m)
   - A minimum deflector to top of storage clearance of 18" (457 mm)
   - A minimum design density of .80 gpm/ft ^{2} (32,6 mm/min)
   - A minimum operating pressure of 7 psi (0,5 bar)
   - A minimum design area of 2,000 ft ^{2} (186 m ^{2}) for wet systems or 4,500 ft ^{2} (418 m ^{2}) for dry systems

Refer to NFPA 13 for specific requirements for various combinations of building heights, storage heights, sprinkler- to-commodity clearance, storage arrangements, commodity classifications, and lesser or greater required design densities.

Note: This sprinkler is a Control Mode Sprinkler.

Temperature Ratings

Classification	Sprinkler Rating		Maximum Ambient Temperature		Frame Color
	°F	°C	°F	°C	
Ordinary	165	74	100	38	Uncolored
Intermediate	212	100	150	66	White
High	286	141	225	107	Blue

Special Application Finishes	
Lead Plated	165 °F (74 °C), 212 °F (100 °C) and 286 °F (141 °C) Temp. Ratings
Wax-Coated [1][2]	165 °F (74 °C) Clear Wax, 212 °F (100 °C) Brown Wax.
Wax-Coated Over Lead Plated [1][2]	165 °F (74 °C) Clear Wax, 212 °F (100 °C) Brown Wax.

[1] 212 °F (100 °C) brown wax may be used on 286 °F (141 °C) sprinklers when maximum ambient temperatures do not exceed 150 °F (66 °C).

[2] Not FM Approved.

Caution: The AG Standard Response AG168 Upright Sprinkler must be installed and maintained per the application NFPA standards, as well as the standards of other authorities having jurisdiction.

Installation

The Model AG168 Upright Sprinklers are to be installed as follows:

- Install in upright position only.
- Apply pipe thread sealant to NPT threads, hand tighten into the sprinkler fitting.
- Install sprinkler by wrench boss only.
- Wrench tighten with the dedicated AG4 Sprinkler Wrench.
- A leak tight ¾ NPT (R3/4) sprinkler joint can be obtained with a torque of 14 - 20 ft. lbs.
- Higher torques may compromise the seal or function integrity of the sprinkler.

Maintenance

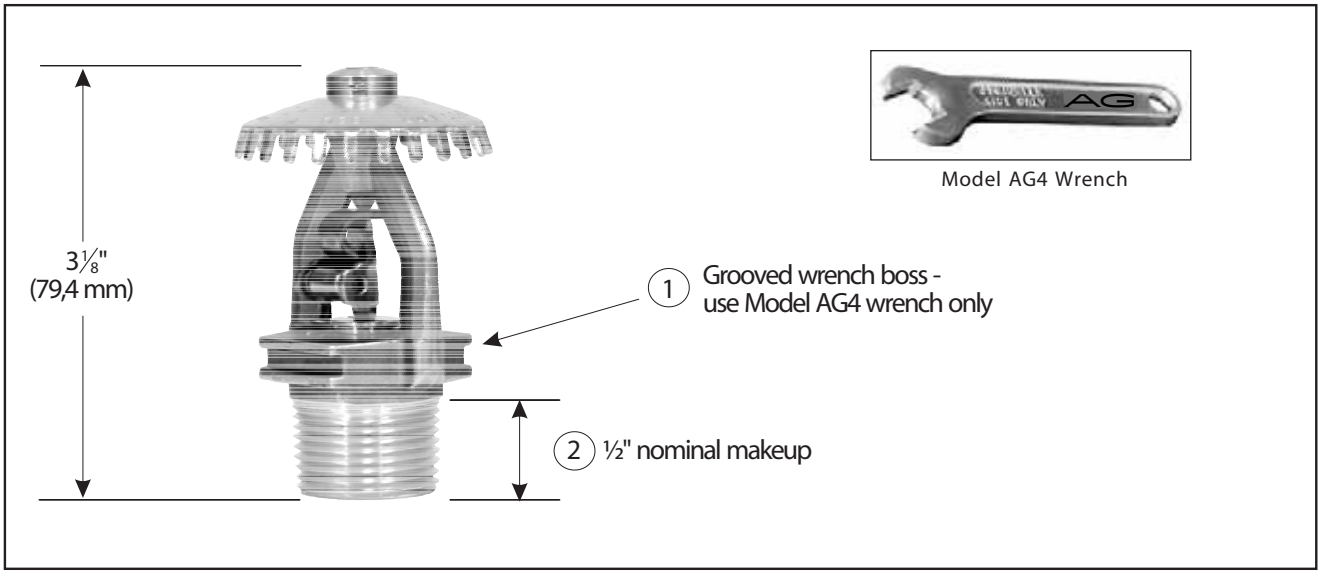
Model AG168 Sprinklers should be inspected quarterly and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Removed ust by using a soft brush or gentle vacuuming. Remove any sprinkler that had been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-activation.

Engineering Specification
Model AG168 Standard Response Upright Sprinkler

Sprinklers shall be standard response upright spray sprinklers cULus Listed for use in occupancy classifications up to and including extra hazard, and for storage occupancies in accordance with NFPA 13. Sprinkler construction shall be a bronze, die-cast frame with grooved wrench flat and copper-alloy deflector. Water seal assembly shall consist of a fusible solder thermal element utilizing a center strut solder-in-compression principle of construction with metal Belleville spring washer, coated on both sides with Teflon film. Sprinkler temperature rating shall be [165 °F (74 °C)] [212 °F (100 °C)] [286 °F (141 °C)]. Sprinklers shall have a nominal K-factor of 16.8 (241.9) and have a ¾" NPT (R ¾) thread. The rated working pressure shall be 175 psi (12.1 bar). Standard finish shall be bronze. Sprinklers shall be Model AG168 standard response upright sprinklers, Bulletin 008 (SIN AG1124).

Special Application Finishes Option:

Exposed sprinklers subject to corrosive atmospheres shall have a factory-applied [165 °F (74 °C) clear wax-coated] [212 °F (100 °C) brown wax-coated] [lead plated for 165 °F (74 °C), 212 °F (100 °C), or 286 °F (141 °C)] [wax-coated over lead plated] corrosion resistant coating.



Model AG4 Wrench

Note: 1. Grooved sprinkler boss provided to insure that the Sprinkler wrench does not slip during installation.

2. A tight ¾" NPT sprinkler joint should be obtained with a torque of 14 to 20 ft. lbs. Higher levels of torque may distort the sprinkler inlet cause leakage or impairment.

AG...For Complete Protection

AG offers a wide selection of sprinkler components. Following are some of the many precision-made Reliable products that guard life and property from fire around the clock.

- Automatic sprinklers
- Flush automatic sprinklers
- Recessed automatic sprinklers
- Concealed automatic sprinklers
- Adjustable automatic sprinklers
- Dry automatic sprinklers
- Intermediate level sprinklers
- Open sprinklers
- Spray nozzles
- Alarm valves
- Retarding chambers
- Dry pipe valves
- Accelerators for dry pipe valves
- Mechanical sprinkler alarms
- Electrical sprinkler alarm switches
- Water flow detectors
- Deluge valves
- Detector check valves
- Check valves
- Supertrol electrical system
- Sprinkler emergency cabinets
- Sprinkler wrenches
- Sprinkler escutcheons and guards
- Inspectors test connections
- Sight drains
- Ball drips and drum drips
- Control valve seals
- Air maintenance devices
- Air compressors
- Pressure gauges
- Identification signs
- Fire department connection

The equipment presented in this bulletin is to be installed in accordance with the latest pertinent Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by AG have been protecting life and property for many years, and are installed and serviced by the mosthighly qualified and reputable sprinkler contractors throughout the world.

AG SPRINKLER